CAES researchers are working to create a new software program that merges public opinion about transmission lines with GIS technology.

Research project taking on transmission line siting

By Kortny Rolston, *INL Communications & Governmental Affairs*

When it comes to siting a transmission line, it is fairly simple to use GIS mapping technology to draw a route that avoids geographical obstacles like a national park or river.

Getting the public to buy into a proposed route, however, is much harder.

David Solan and his team surveyed over 600 people in southern Idaho about their views on transmission lines and where the lines should be located.

That's why researchers with the Center for Advanced Energy Studies (CAES) at Idaho National Laboratory are creating a new software program that merges public opinion about transmission lines with GIS technology. CAES is a research partnership among INL, Boise State University, Idaho State University and University of Idaho.

Known as LineSiter, the program's goal is to reduce public friction over new transmission lines and the amount of time it takes for new routes to be approved and built.

"Siting a transmission line can be a long, arduous and expensive process," said David Solan, a Boise State University researcher who leads the CAES Energy Policy Institute. "It now takes eight to 10 years to site and build a transmission line. We think this program will be a very useful tool and will save utilities — and ultimately ratepayers — time and money."

Solan and Daniel Ames, a CAES researcher from Idaho State University who specializes in GIS technology, started working on the project two years ago. (It is being funded through a CAES program that provides seed money for innovative research projects.)

Solan and his team at the Energy Policy Institute have spent much of that time developing questions and surveying 600-plus people in southern Idaho about their views on transmission lines and where the lines should be located.

It is that information, he said, which sets the LineSiter program apart.

While there are GIS programs that compute the least expensive route based on the actual costs of navigating terrain, LineSiter is the first to account for both cost and social attitudes.

In addition, the CAES program is based on real social data, which Solan believes is the first of its kind collected for such a project.

"As far as I know, we're the only team building a program like this using actual data based on surveys and how people responded," he said.

LineSiter's main goal is to help to reduce public friction over where new transmission lines are sited.

LineSiter uses a free and open source geographic information system programming library called DotSpatial that was developed at ISU with the help of international volunteers.

Ames and his team have been working on the algorithms and framework necessary to incorporate the survey results. They will spend the next year refining the open-source LineSiter program, which evaluates spatial and social data and then runs calculations to determine a route.

"It basically identifies areas as hot and cold and then finds the safest areas in which to build a line," Solan said.

Solan has wanted to create a program like LineSiter since working for a congressional energy committee during the early 2000s.

It was there that he first saw how controversial energy projects can be. He watched public opposition kill several transmission projects, including one in which a developer had spent millions siting a proposed route.

He said the public's views need to be incorporated into a project at the beginning, not after a proposed route has been identified.

"Once a project reaches a certain point, you can't go back and fix it. It costs too much money," Solan said. "You are better off addressing it on the front end rather than be delayed."

He believes LineSiter can help engineering firms and utilities do that.

"This is a great way to complement the engineering and technical studies to develop possible paths," he said. "Of course, the developer still needs strong outreach to engage specific communities to get the project done."

Once the open-source LineSiter program is complete, the public will have access to it.

Solan and Ames believe it will become a useful tool for utilities, especially those in the Intermountain West whose residents may harbor similar views as those his team surveyed. (Utilities in other regions would be able to use the survey questions to gather their own social data.)

In the West alone, there are more than 30 high-priority lines that need to be con-structed to meet demand and government mandates for renewable energy.

"Would it work in Maryland? We don't know," Solan said. "But we think it would work in Colorado, Montana and Wyoming. We think it is pretty transferable to anywhere in the Intermountain West."

For more information, go to www.linesiter.com or visit the CAES Energy Policy Institute at http://epi.boisestate.edu/.

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